

Axions in Japan



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Axion dark matter searches with KAGRA and DANCE

Using laser interferometry, we search for ultralight axion dark matter through the polarization modulation induced by the axion-photon coupling. In particular, the tabletop-scale optical ring cavity experiment DANCE (Dark matter Axion riNg Cavity Experiment) aims for a broadband search and we carried out its first run in 2021 [1]. The experiment is now being upgraded with a wavelength-tunable laser to achieve higher sensitivity and a tunable frequency band [2]. In parallel, a dedicated polarization optics for axion detection has been installed at the gravitational wave telescope KAGRA in Kamioka, Gifu, making it possible to observe gravitational waves and axions simultaneously for the first time since June 2025 [3]. In this talk, I will report on the current status and future prospects of both experiments.

[1] Y. Oshima+, Phys. Rev. D 108, 072005 (2023)

[2] H. Takidera+, Phys. Rev. D 112, 063048 (2025)

[3] K. Nagano+, Phys. Rev. Lett. 123, 111301 (2019)

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